

IAP5 Rec'd PCT/PTO 31 JUL 2006

10/588111

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CORKSCREW

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DESCRIPTION

The present invention refers to a corkscrew, in which at least one of the
15 movements of an arm provided with abutting members interacting with
the neck of the bottle is driven, i.e. assisted so as to facilitate pulling out
the cork.

Patent application EP 0 143 475 A1 discloses a corkscrew, in which the
20 pivoting connection, which associates the handgrip with the arm intended
for resting against the neck of a bottle, is movable, and the corkscrew
itself is further provided with cam means co-operating with an abutment
surface provided in said arm. A typical drawback found in a corkscrew of
this kind lies in the fact that the displacement of the pivoting connection
25 of the arm, which is brought about by the force applied by the user during
the cork drawing operation, is hindered by the resisting action brought
about by the friction intervening between said pivoting connection and the
guide within which said connection is displaceable. The need of exerting a
relatively intense force on the corkscrew causes, after a certain number of
30 use cycles thereof, the contact surfaces of the cam means and the related
abutment to wear down, thereby impairing the effectiveness of the
corkscrew operation. As a result, a need is generally felt for reducing the

effort required to complete the corkscrew operation for drawing a cork from the neck of a bottle.

Also known from the disclosure in the above-cited patent application EP O 143 475 A1 are corkscrews, in which the pivoting connection of said arm with the handgrip is displaceable between two or more positions regardless of the rotation of the handgrip, thereby allowing the distance from the fulcrum of the lever and the pivoting connection of the screw to vary as a cork drawing operation is being performed.

A drawback typically found in the use of corkscrews of this kind lies in the fact that the operation to pull out the cork from the neck of the bottle proves particularly awkward and demanding to carry out, since the user is required to pay a lot of attention to the position into which he/she sets the lever fulcrum during the various phases of the cork drawing operation, considering that, once the lever fulcrum is forced out of a given position, the fulcrum itself is practically free to move without any control and, therefore, might well move into a second undesired position.

A corkscrew provided with a displaceable fulcrum, and enabling a cork to be pulled out in a two-step procedure, is described in EP O 041 026 A1. A corkscrew of this kind, however, has a major drawback in that the user, upon completing the first step provided for by the cork drawing procedure, must re-position the resting arm on the bottle, wherein he/she must pay attention to the fulcrum of the lever, which must be situated in a position where the distance thereof from the pivoting connection of the screw is at a maximum. This operation, which of course takes place when the screw is still inserted in the cork, is made rather awkward by the position that must necessarily be taken by the handgrip of the corkscrew in order to repeat a part of its displacement and completing the pulling out of the cork. Said handgrip must in fact be inclined just on the side that, by the effect of gravity, favours the fulcrum to become positioned in a region close to the position which is the nearest one to the pivoting connection of

the screw. This circumstance is rather undesired, actually, since it practically induces the fulcrum to become positioned in a manner that is just the opposite of the one that should on the contrary be attained for a greater effectiveness in completing the second step of the cork drawing operation. It can moreover be readily appreciated that a correct re-positioning of the fulcrum according to the indications in EP 0 041 026 A1 would anyway prove particularly difficult if the aperture, within which the fulcrum is capable of moving, is not provided with appropriate positioning notches corresponding to the greatest and smallest distance of the same fulcrum from the pivoting connection of the screw.

It therefore is a main object of the present invention to provide a corkscrew that overcomes the typical drawbacks of prior-art corkscrews.

Within this general object, it is a purpose of the present invention to provide a corkscrew that is effective in enabling the effort required to pull a cork out of a bottle to be sensibly reduced.

Yet a further purpose of the present invention is to provide a corkscrew, in which the movement of the abutting arm is such as to enable the operations involved in pulling out a cork from a bottle to be simplified.

A final, although not less important purpose of the present invention is to provide a corkscrew, which is simple to manufacture and assemble.

According to the present invention, these aims as set forth above are reached in a corkscrew incorporating the characteristics as described below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a partially cross-sectional view of a first embodiment of the corkscrew according to the present invention, as shown in a state in which it engages a cork in the neck of a bottle;

- Figure 2 is a partially cross-sectional view of the embodiment illustrated in Figure 1, as shown during the drawing of a cork from a bottle;

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- Figure 3 is a partially cross-sectional view of a second embodiment of the corkscrew according to the present invention, as shown in a first drawing step of the cork from a bottle;

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- Figure 4 is a partially cross-sectional view of the embodiment illustrated in Figure 3, as shown in a second drawing step of the cork from a bottle;

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- Figure 5 is a partially cross-sectional view of the embodiment illustrated in Figure 3, as shown in a state in which the elastic means have been disassembled;

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- Figure 6 is a view of a third embodiment of the corkscrew according to the present invention, in which the arm is arranged for a first drawing step of the cork from a bottle;

- Figure 7 is a view of the embodiment illustrated in Figure 6, in which the arm is arranged for a second drawing step of the cork from a bottle;

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- Figure 8 is a view of a fourth embodiment of the corkscrew according to the present invention, in which there is provided a device for cutting off a film used to cover and seal the opening of the neck of the bottle.

With reference to Figure 1, it is shown a first embodiment of the corkscrew according to the present invention. An end portion of the corkscrew illustrated in this Figure has been intentionally represented as a cross-sectional view in order to highlight the articulation of the various moving parts. The corkscrew comprises a handgrip 1, on which there is

mounted a screw 2 by means of a first pivoting connection 3. The screw 2, of a kind known as such in the art, is adapted to perforate the material which a cork 7 used to stop a bottle 6 is made of. The corkscrew further comprises an arm 4 provided with first abutting members 5 engaging the neck of a bottle 6 during the cork drawing operation. The arm 4 is associated to the handgrip 1 by means of a second connection 21 enabling the arm 4 to rotate. This second connection 21 is preferably constituted by the coupling of a stud 8 with a slot 9, so that the arm 4 is able to perform a second movement, in particular a translatory movement. In the example shown in Figure 1, the stud 8 is firmly joined to the arm 4, whereas the slot 9 is provided in the handgrip 1. It will of course be appreciated that a connection 21 may also be used, in which the stud 8 is firmly joined to with the handgrip 1, whereas the slot 9 is provided in the arm 4, as this shall be illustrated in greater detail further on. In the same way, other types of connections may be used, as well, such as for instance connections that would enable the arm 4 to perform two pivoting motions about different centres, while it will similarly be appreciated that particular forms of the connection 21 may be provided, which would enable the arm 4 to perform any number and kind whatsoever of motions to more suitably comply with any particular requirement or need.

The corkscrew 1 illustrated in Figure 1 comprises elastic means 10, which, as this shall be explained in a more detailed manner further on in this description, are capable of affecting at least one of the movements performed by the arm 4 in view of assisting in pulling out the cork 7 from the bottle 6. In this first embodiment of the present invention, the elastic means 10 are constituted by a coil spring 14 and are situated between the arm 4 and the handgrip 1. In a preferred manner, these elastic means 10 are accommodated in a compartment within the handgrip 1 and connect the handgrip 1 to the stud 8 that is firmly joined to the arm 4.

In the position represented in Figure 1, the corkscrew is ready to start pulling out, i.e. drawing the cork 7. The arm 4 is arranged so that the first

abutting members 5 engage the neck of the bottle 6, and so that the stud 8 comes to lie close to the end portion of the slot 9 that is the nearest one to the pivoting connection 3 of the screw 2. Bringing in this way the arm 4 close to the first pivoting connection 3 entails an increase in the potential energy of the elastic means 10; during the operation performed to pull out the cork 7, such energy will be converted into a force acting on the arm 4, thereby affecting the translatory movement thereof. In the case that a coil or spiral spring 14 is used as the elastic means 10, such force will be a pulling force.

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In Figure 2 the corkscrew is represented in a state as the cork 7 is being pulled out from the bottle 6. The action exerted by the user on the handgrip 1 causes the slot 9 to displace, while a surface 11 provided on the arm 4 moves into contact with cam means 12 provided on the handgrip 1. The angular displacement of the handgrip 1 is assisted by the action of the elastic means 10, which exert a force on the arm 4, thereby affecting the movement thereof in the sense of not only facilitating the cork 7 being pulled out, but also opposing the contrasting action exerted by the friction forces generated between the stud 8 and the slot 9. In this manner, the effort that the user must exert in order to displace the handgrip 1 angularly is positively reduced.

The elastic means 10 are adapted to favour a movement of the arm 4 in a first direction, as well as to oppose such movement in a second direction opposite to the first one. Advantageously, said first direction is the one in which the drawing operation for pulling out the cork 7 is favoured, i.e. the direction in which the arm 4 moves away from the first pivoting connection 3 of the screw 2 to the handgrip 1.

Figure 3 illustrates a second embodiment of the corkscrew according to the present invention, in which – similarly to the illustrations appearing in Figures 1 and 2 – an end portion of the corkscrew has been intentionally represented as a cross-sectional view in order to highlight the articulation of the moving parts. The corkscrew illustrated in Figure 3 is of the type

adapted to pull out a cork 7 in a two-step procedure. The handgrip 1, along with the screw 2, the first pivoting connection 3 and the second connection 21 constituted by the coupling of a stud 8 with a slot 9, are fully similar to the corresponding parts and details that have been described with reference to Figures 1 and 2. What actually differs from the previously illustrated embodiment is the conformation of the arm 4', which comprises second abutting members 13 situated between the first abutting members 5' and the type of elastic means 10 used in this case. In this second embodiment of the corkscrew according to the present invention, in fact, the elastic means 10 are constituted by a flat or leaf spring 15, which may advantageously be accommodated in an appropriate recess or compartment provided in the handgrip 1. This flat spring 15 has a portion of the surface thereof that is in contact with the handgrip 1, while another portion of the surface thereof is in contact with the stud 8 provided firmly joined to the arm 4'. It will of course be readily appreciated that, if the configuration of the second connection 21 is such that the slot is provided in the arm and the stud is on the contrary firmly joined to the handgrip, the elastic means 10 need to be arranged between the arm and the handgrip.

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In Figure 3, the corkscrew is represented in the configuration that enables the first cork drawing step to be started. The screw 2 is inserted in the cork 7 over most of the length thereof and the second abutting members 13 engage, i.e. bear against the neck of the bottle 6. The stud 8 is situated near the end portion of the slot 9, which is the nearest one to the pivoting connection 3 of the screw 2. The particular arrangement of the arm 4' illustrated in Figure 3 has the practical effect of increasing the potential energy of the elastic means 10. By applying a force on to the handgrip 1 so as to cause it to pivotally rotate, a first part of the drawing operation of the cork 7 is completed. As this has already been described in connection with the first embodiment, the elastic means 10 are effective in reducing the effort requested to move the handgrip 1, thereby assisting in pulling out the cork 7. Moreover, once the first cork drawing step is

completed, the user must re-position the arm 4' so as to bring the first abutting members 5' in contact with the neck of the bottle 6. This operation, which takes place while the screw 2 is still inserted in the cork 7, is facilitated by the release of the potential energy built up and stored in the elastic means 10 at the beginning of the first cork drawing step of the procedure. This energy is converted into a force that is effective in causing the arm 4' to displace towards the end of the slot 9, which is the farthest away from the first pivoting connection 3. The stud 8, which is firmly joined to the arm 4', is therefore moved into an optimum position in view of completing the cork drawing operation for pulling out the cork 7.

In practice, for the user to change over from the configuration that the corkscrew comes to take at the end of the first cork drawing step to the configuration that is more suited to starting the second cork drawing step, as illustrated in Figure 4, the user him/herself just needs to disengage the arm 4' through a slight angular displacement of the handgrip 1 in the opposite direction with respect to the one followed to perform the first cork drawing step. In this manner, the arm 4' will be practically driven to move into the position required to complete the cork drawing operation for pulling out the cork 7. In order to favour a variation in the speed of movement of the arm 4', the flat spring 15 comprises at least a surface portion 16 and 16' featuring a cusp-like conformation. This contrivance will in fact be effective in ensuring that, when brought into contact with the flat spring 15, the stud 8, or the arm 4' depending on how the connection 21 is actually implemented, will displace on a surface having a different sloping pattern, thereby changing its speed of displacement.

Figure 5 illustrates the second embodiment of the corkscrew according to the present invention, in which the elastic means 10, in the form of a flat spring 15, have been disassembled from the handgrip 1. These elastic means 10 are accommodated in a recess, or compartment, provided between two parallel walls 17 and 17', which define the end portion of the corkscrew to which there is associated the arm 4'. The flat spring 15 comprises a first surface portion 18 which, when the spring is assembled

in the corkscrew, bears against the portion 19 connecting the two walls 17 and 17' of the handgrip 1 to each other. A second surface portion 20 of the flat spring 15 interacts with the stud 8 associated to the arm 4' so as to affect at least a displacing movement thereof.

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The arrangement of the flat spring 15 within the handgrip 1 illustrated in Figure 5 is based on a kind of connection 21 of the slot-and-stud type selected for this second embodiment of the corkscrew according to the present invention by way of non-limiting example. It will of course be
10 readily appreciated that other configurations may be used in accordance with the kind of connection 21 used, as well as the kind of movement of the arm that has to be affected, i.e. assisted, wherein all these configurations will fall within the scope of the present invention.

15 Figures 6 and 7 illustrate a third embodiment of the corkscrew according to the present invention. By way of example, the arm 4' has in this case been conformed so as to allow for a cork to be pulled out in a two-step procedure, in much the same way as previously described in connection with the second embodiment of the corkscrew according to the
20 present invention. It will of course be appreciated that use can be made here of even an arm 4 of the type illustrated in Figures 1 and 2. Anyway, in this third embodiment of the present invention, the connection 21 of the arm 4' to the handgrip 1 is constituted by a stud 8, which is firmly joined to the handgrip 1, and a slot 9 that is provided in the arm 4'.

25 Figure 6 illustrates the arm 4' as arranged in the position that allows for the first cork drawing step to be performed, i.e. in the position that is the nearest one to the first connection 3 of the screw 2 to the handgrip 1. In this manner, the second abutting members 13 are able to engage the neck of a bottle when the screw 2 is inserted in the cork. Such
30 arrangement of the arm 4' enables the potential energy of the elastic means 10, as constituted preferably by a spiral or coil spring 14, to be increased, so as to favour a movement of the arm 4' in a first direction of displacement, while opposing such movement in a second, opposite

direction. Said first direction is the one in which said arm 4' moves away from the first connection 3.

For the user to change over from the configuration of the corkscrew illustrated in Figure 6 to the one illustrated in Figure 7 for the second cork drawing step, the procedure that needs to be followed is fully similar to the previously described one with reference to the second embodiment of the corkscrew according to the present invention. The elastic means 10 will in this case drive the arm 4' to displace towards the position which is allowed by the connection 21 to be the farthest one from the first connection 3 of the screw 2, so as illustrated in Figure 7. In this manner, the first abutting members 5' will be able to engage the neck of the bottle in view of completing the cork drawing procedure. It should be noticed how, owing to the kind of connection 21 used, the position of the arm 4' at the beginning of each one of said two cork drawing steps of the procedure is a reciprocal one with respect to the positions taken by the same arm 4' in the second embodiment of the present invention illustrated in Figures 3 to 5. The action of the elastic means 10, however, is the same in and for all embodiments of the present invention, so that the concept behind it may advantageously be used in any type of corkscrew whatsoever.

In this third embodiment of the present invention, the elastic means do not only affect the translatory movement that the arm 4' is able to perform relative to the handgrip, but also the pivoting movement of said arm relative to the same handgrip. It therefore ensues that the present invention may be embodied in such a manner as to practically enable the elastic means 10 to affect those movements of the arm 4', on which it is most appropriate and suitable to intervene in order to facilitate drawing a cork from a bottle.

Illustrated in Figure 8 is a fourth embodiment of the present invention, wherein the arm 4' is of the same type as the arms already illustrated in connection with both the second and the third afore-considered

embodiments, i.e. comprising first and second abutting members 5' and 13 to perform a two-step procedure for pulling out a cork from a bottle. The corkscrew is provided with a screw 2 mounted on to a handgrip 1 by means of a first pivoting connection 3. The second connection 21 between
5 the arm 4' and the handgrip 1 is made in substantially the same manner as this has already been described hereinbefore in connection with the first and the second embodiment of the present invention. A stud 8, firmly joined to the arm 4', is capable of displacing in a slot 9 in which, in this particular embodiment, there is provided a notch 22 adapted to determine
10 a stop position for the stud 8 to come to rest in between the first and the second step of the cork drawing procedure. Elastic means 10, constituted by a spiral or coil spring 14, are provided to affect the translatory movement of the arm 4' relative to the handgrip 1 in view of facilitating the drawing of a cork from a bottle.

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The elastic means 10 are arranged between the arm 4' and the handgrip 1 and, in particular, they are accommodated in a recess or compartment provided inside the handgrip 1 so as to connect the latter with the stud 8 firmly joined to the arm 4'. Drawing the cork from the
20 bottle occurs in a manner that is similar to the one that has already been described in connection with the second embodiment of the present invention. The elastic means 10, although constituted by a spiral or coil spring 14 in this case, are configured so as to increase their own potential energy as a result of a displacement of the arm 4' in a direction in which it
25 moves closer to the first pivoting connection 3.

The handgrip 1, in a region thereof that is opposite to the one accommodating the connection 21 of the arm 4', comprises a cutting arrangement 23 for cutting off and removing a film that is applied on to
30 the neck of a bottle in order to seal and protect the opening in which the cork is inserted. The cutting arrangement 23 comprises a stationary portion 26 formed in the handgrip 1 and a support 27 slidably associated to said handgrip 1 by means of two guides constituted by arms 28 integral

with the support 27 and capable of sliding into apertures 29 provided in said stationary portion 26. The support 26 is displaceable relative to the stationary portion 26 between a resting position, in which the support 27 is practically bearing against the portion 26 and the arms 28 are fully
5 inserted in the corresponding apertures 29, and a second operating position, in which the support 27 is moved away from said portion 26 and the arms 28 are fully extended out of said apertures 29, so as this is illustrated in Figure 8.

10 The cutting arrangement 23 comprises proper blades or cutters, preferably in the form of four small cutting wheels 24, 25 adapted to rotate relative to the handgrip 1 about an axis that is orthogonal to the longitudinal extension of said handgrip 1. A first pair of cutting wheels 24 is located on the stationary portion 26 of the handgrip 1, while a second
15 pair of cutting wheels 25 is arranged on the support 27.

The support 27 and the stationary portion 26 comprise cavities 30 that are in the shape of a circumferential arc and are arranged so as to face each other, so that, when the support 27 is in its operating position
20 (Figure 8), they form a recess 31 of an adequate size to accommodate an end portion of the neck of a bottle. When this neck of a bottle is inserted in the recess 31, the cutting wheels 24, 25, which are arranged so as to adequately protrude into the recess 31, are able to interfere with a film applied to the bottle neck in order to seal it, thereby cutting it off so as to
25 uncover the cork inserted in said neck and enable it to be then removed by the cork pulling out procedure.

It will of course be appreciated that the number of the cutting wheels 24, 25 and the conformation and shape of the support 27, as well as the
30 connection thereof to the stationary portion 26 of the handgrip 1, may vary and be selected to most properly comply with particular requirements or to suit a particular application. For instance, the support 27 may be hinged on to the handgrip 1 and the cutters may be constituted by one or

more wheels.

Fully apparent from the above description is therefore the ability of the corkscrew according to the present invention effectively reach the afore cited
5 aims and advantages. What the present invention in fact provides is a corkscrew which is effective in facilitating the operations to be performed in view of taking a cork out of the neck of a bottle. The corkscrew according to the present invention has a simple, easy-to-assemble structure and can be embodied according to a multiplicity of variants, all of which
10 fully and similarly effective in reaching the aims of the present invention. In addition, the movement of the moving parts of the corkscrew, and particularly of the arm that includes the abutting members for the corkscrew to bear against the bottle, is so assisted as to make the corkscrew easier and more convenient to use and handle.

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